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Bayabusua, a new genus of *Cucurbitaceae*

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Summary. *Bayabusua* W.J. de Wilde is described as a new genus in Cucurbitaceae, based on *Alsomitra clarkei* of which recently male flowers became available for study. Its position in the subtribe Zanoniinae of subfamily Zanonioideae, is discussed. A morphological note on the male flowers is presented by W.A. van Heel.

The discovery of male flowering and additional fruiting material of *Alsomitra clarkei* made it clear that this little-known species (of which female flowers are still unknown) represents a new genus. It differs in several unique characters and in a hitherto unknown combination of characters from related genera of subfamily Zanonioideae, to which it obviously belongs. Subfamily Zanonioideae is characterized by: ovules pendulous; seed mostly winged; styles 2 or 3, free; tendrils distally bifid, branches short, spiralling below and above the point of bifurcation; filaments inserted on or about the disc (which is mostly not more than the thickened, carnose, cup-shaped hypanthium or receptacle); pollen grains small, tricolporate, striate. In the other subfamily, Cucurbitoideae, these characters are: ovules variously placed; seeds mostly unwinged (in Asian genera); style 1; tendrils unbranched or 2–7-fid, spiralling (mostly) above the point of branching, the latter proximal and the branches long, very rarely of zanonioid type; filaments inserted on the hypanthium, free from the disc when the latter is present; pollen grains various, not striate (Jeffrey 1962, 1980, 1990). In a separate article, R.W.J.M. van der Ham (1999) presents a study of the pollen in the four Asian genera of subtribe Zanoniinae.

THE NEW GENUS

Bayabusua *W.J. de Wilde*, **gen. nov.**

Liana. Cirrhus supra-axillaris. Inflorescentia erecta racemo similis. Flores masculi rotati, corolla purpureo-rubra c. 12 mm diam. Stamina 3 libera, duobus antheris bithecis una

monotheca. Capsula claviformis 3-valvata c. 23 cm longa, apice plano. Semina numerosa margine 8-spinoso ala lata membranacea circulari c. 5 cm diam. cincta.
Typus: Bayabusua clarkei (King) W.J. de Wilde.

Tall liana, dioecious; young plant sprawling, with first basal foliage leaves in one tier of 3 or 4. Tendrils slightly supra-axillary, not off-axillary, always with adhesive pads. Petiole scar raised. Leaf simple, margin entire. Male inflorescences erect, raceme-like panicles, bracteate, with axillary clusters of few flowers. Male flowers rotate, sepals quincuncial, corolla lobes nearly free, contorted, revert at apex, purple-red; stamens 3, inserted near the centre, anthers basifixed, two 2-thecous and one 1-thecous; thecae oblong, opening lengthwise, with swollen creamy-white connectives with a brown wart near the apex. Female inflorescences small, 1(or few)-flowered; female flowers not known. Fruit single, cylindrical-clavate, capsular, *c.* 23 × 10 cm, apex flattened, opening with 3 valves towards the inside. Seed numerous, flat, with 8 or 9 coarse marginal spines, and a membranous circular wing surrounding the seed, *c.* 5 cm diameter.

Monotypic, in Peninsular Malaysia.

Bayabusua clarkei *(King) W.J. de Wilde,* **comb. nov.**

Zanonia clarkei King, Journ. As. Soc. Beng. 67 (1898) 41; Ridley, Fl. Mal. Pen. 1 (1922) 852. *Macrozanonia clarkei* (King) Cogn., in Engl. Pflanzenr. IV.275.I (1916) 264. *Alsomitra clarkei* (King) Hutch., Ann. Bot. N.S. vol. 6 (1942) 96. Type: *King's Collector* 7230 (CAL, *n.v.*; isotype K).

Tall liana, reaching 20–40 m on lofty trees. Shoots slender, 1.5–4 mm diameter, grooved, early glabrescent, at first with minute red-brown powdery hairs less than 0.1 mm. Young plant with 4 verticillate, petioled pseudocotyledon-like basal first leaves, then sprawling, with leaves dispersed, with long internodes. Tendrils supra-axillary, 10–15 cm long, less than 1 mm thick, arms distal, (1–)1.5–2.5 cm long, pads 2–6 mm diameter. Leaves somewhat fleshy, glossy (drying dull, membranous and brittle); petiole 0.5–3 cm × 1–2 mm, after abscission by drying leaving a raised scar; blade broadly ovate, faintly laterally lobed towards the base, 3–15 × 2–12 cm, base (broadly) rounded or shallowly cordate with broad, open, sinus, apex short acute-acuminate; margin (sub)entire (but juvenile leaves coarsely sinuate and apiculate-dentate); nerves 5(–7)-palmate, venation lax. Lateral shoots and inflorescences developing from the axils between the petiole and the tendril. Inflorescences in male a spike-like, bracteate, indeterminate panicle, growing at the apex, suberect, peduncle 0.5–1 cm long, up-curved, rachis 5–20 cm long, grooved, *c.* 2 mm thick, purple-red, about as thick as the green, drooping, supporting shoots; bracts 5–30, subcaducous, 5–10 mm spaced along the rachis, erecto-patent, elliptic-oblong, acute, 5–15 mm long, greenish-purplish, each with axillary a cluster of 2–5 flowers with buds in different stages

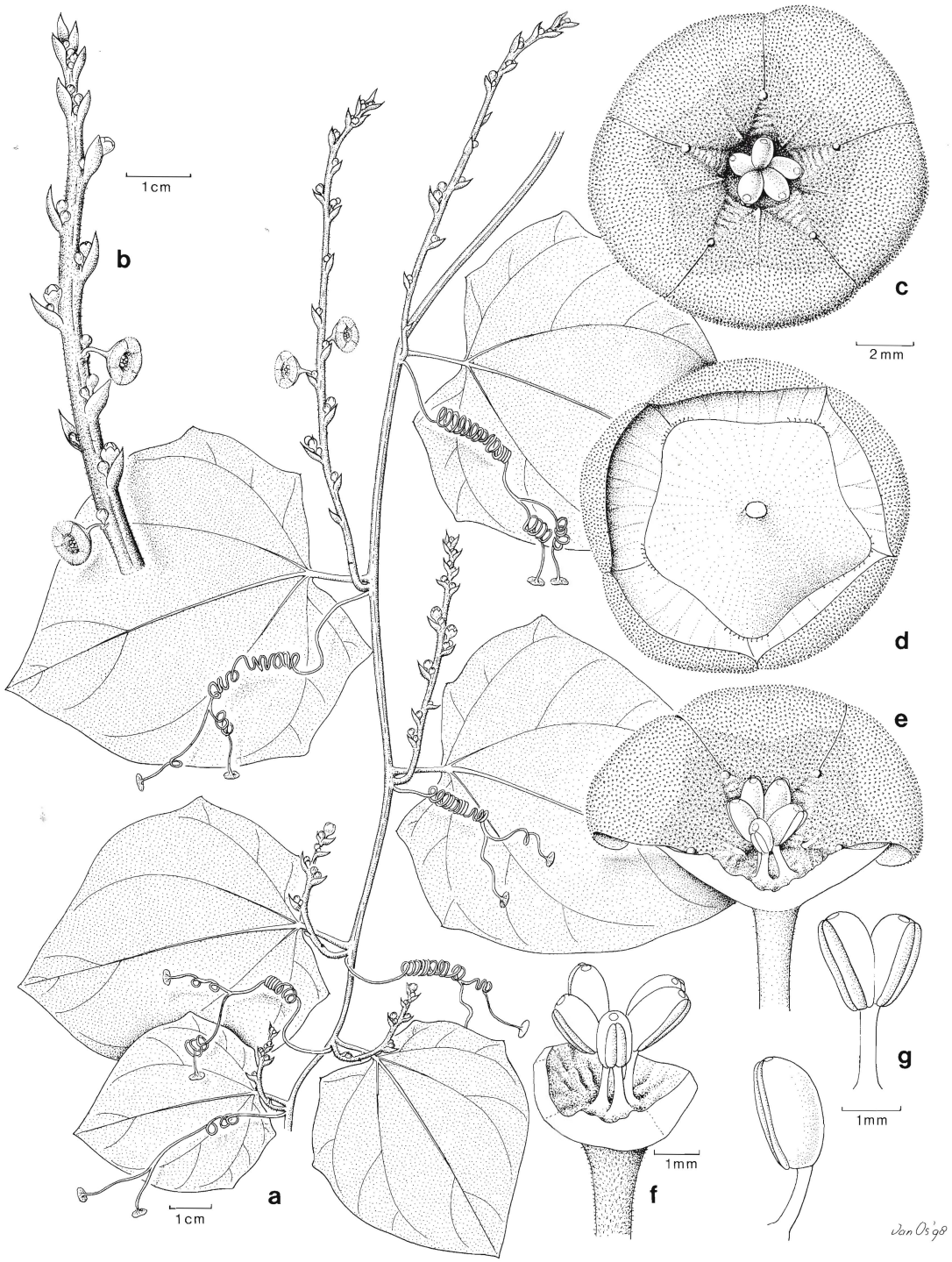
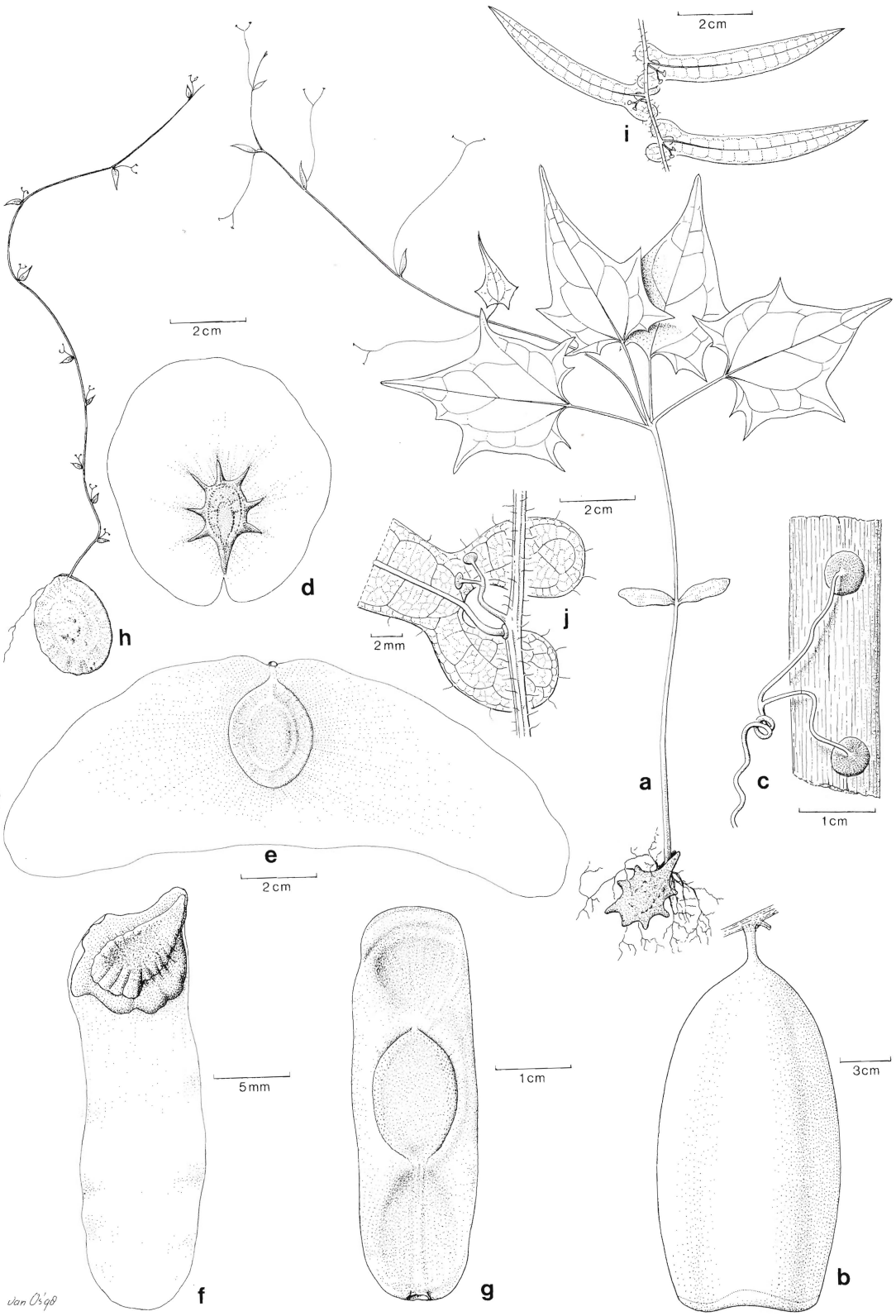


Fig. 1. *Bayabusua clarkei*. **A.** Habit of male flowering shoot. **B.** Upper portion of inflorescence. **C.** Male flower from above. **D.** Male flower from below. **E.** Male flower, longitudinally dissected, showing androecium. **F.** Androecium, two 2-thecous stamens, one 1-thecous stamen. **G.** One 2-thecous and one 1-thecous stamen. All from *de Wilde & Duyfjes* (21834) FRI 41901.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of development, in each inflorescence only a few flowers at anthesis simultaneously. Female inflorescences (according to infructescences) small, less than 5 mm long, 1- (or few-)flowered. Male flowers somewhat carnose-juicy, with purple-red corolla; pedicel short, slender, slightly tapering, *c.* 4 × 0.5–1 mm; hypanthium shallowly cup-shaped, *c.* 5 mm diameter, *c.* 0.5 mm thick, firm-carnose (disc); calyx lobes 5, almost free, in mature bud *c.* 2 mm long, apex rounded, imbricate-quincuncial, in expanded flower broadly obtuse-triangular, together with the hypanthium showing up from below as a pale green pentagon *c.* 9 mm diameter; corolla rotate, circular in outline, *c.* 12 mm diameter, lobes 5, nearly free, imbricate-contorted, broadly obovate, *c.* 3.5 × 4 mm, apex broadly rounded, recurved, purple-red, inside papillose; below each sinus between the corolla lobes, on the inner side of the hypanthium, are hard-carnose, palish, glossy, verrucose, long-triangular markings, with at the apex, just in each sinus, a minute globose creamy-white appendage, contrasting with the purple-red corolla; stamens 3, filaments free, 1.2–1.5 mm long, inserted close to each other in the centre of the disc, slightly out-curved, somewhat tapering, whitish, anthers two with 2 thecae half-way connate below, one with 1 theca, basifixed, broadly oblong, *c.* 2 mm long, extrorse, each with a conspicuously swollen, creamy-white connective with a brown wart *c.* 0.3 mm diameter near the apex, contrasting with the purple-red corolla. Style remnant absent. Female flowers not known. Female plant (always?) monocarpous; fruit single, pendent, a claviform-cylindric capsule, bluntly triangular, 20–25 × 8–10 cm, apex flattened, base rounded, when dry ± narrowed, subacute, pericarp outside woody, thin, *c.* 0.5 mm thick, inside with a spongy-fibrous layer *c.* 10 mm thick, opening at the flat apex by 3 valves curving inward, edge-line of hypanthium at a distance of 5–10(–15) mm from the rim of curving of the valves; fruiting pedicel short, 10–12 × 2–3 mm. Seed numerous, densely packed in 3 rows throughout the fruit, flat, subelliptic, 15–20 × 10 mm, dull brown, faces finely warty, the edge with 8 (or 9) coarse, blunt spines 3–9 mm long, supporting a conspicuous membranous whitish subcircular wing, 1–2.5 cm wide, *c.* 5 cm diameter.

(Figs. 1–3)

SPECIMENS EXAMINED—MALAY PENINSULA. Perak, Gunung Malacca, 300–500 ft., fr. in Jan. 1886, *King's Collector* (*Kunstler*) 7230 (K); km 31 Tapah to Cameron Highlands, *c.* 800 m, fr. Feb. 1995, *de Wilde & Duyfjes* 21781 (= FRI 41402) (KEP, L), *c.*

Fig. 2 (Opposite). Seeds, seedlings and fruit of various Cucurbitaceae. *Bayabusua clarkei* — **A.** Seedling, note cotyledons. **B.** Fruit. **C.** Terminal portion of tendril of older plant, with adhesive pads clinging to supporting dead branchlet of understorey shrub. **D.** Seed, with circular wing. *Alsomitra macrocarpa* — **E.** Seed, with butterfly-shaped wing. **H.** Seedling, note cotyledons remaining in seed. **I, J.** Portion of older ascending shoot, clinging to vertical substrate, 2–3 m from the ground; note typical auricled leaves. *Neoalsomitra trifoliolata* — **F.** Seed, with one-sided wing. *Zanonia indica* — **G.** Seed, with 2-sided wing. A & C from *de Wilde & Duyfjes* 21961; B & D from *de Wilde & Duyfjes* (21781) FRI 41402; E from *de Wilde & Duyfjes* 21792; F from *Kerenga et al.* LAE 73815; G from *de Wilde & Dyufjes* 21855; H from *de Wilde & Duyfjes* 21978; I & J from *Korthals* (2).

Fig. 3. Part of a longitudinally split fruit of *Bayabusua clarkei*, showing the spongy-fibrous fruit wall, and winged seeds. (Photo: W.J. de Wilde)

700 m, male fl. June 1996, *de Wilde & Duyfjes* 21834 (= FRI 41901) (KEP, L), *c.* 800 m, old fruit, seedlings, Aug. 1998, *de Wilde & Duyfjes* 21961 (KEP, L), *c.* 800 m, fallen male flowers, Aug. 1998, *de Wilde & Duyfjes* 21962 (L), *c.* 800 m, old fruit, seedlings, Aug. 1998, *de Wilde & Duyfjes* 21976 (L). Selangor, Ulu Langat, Bukit Tangkol, K. Pansom, hill forest, fl. dark red, Feb. 1960 (flowers not found), *Gadoh anak Umbai* for *Millard* (phytochemical survey) K.L. 1992 (KEP); Batu Caves, fr. Dec. 1898(?), *Ridley* 8275 (SING).

DISTRIBUTION. Known only in Peninsular Malaysia, in the two west-coast states of Perak and Selangor.

ECOLOGY. Foothill and lower montane forest, from 200 m to *c.* 800 m altitude; apparently rare, only five collections known. Flowering recorded during February, June and August; fruiting in December to February, rarely August. In the field, it appeared that plants with mature fruit were dying, so the possibility that this species is monocarpic is both interesting and requires further study.

BAYABUSUA AND OTHER ZANONIOID GENERA COMPARED

The Asian genera of Zanonioideae, all in tribe Zanonieae, are divided into three subtribes (Jeffrey 1980, 1990), all of which have a 2- or 3-locular ovary, as follows:

1. ***Subtribe Zanoniinae*** Pax — Seeds winged; fruit capsular, 2.5–25 cm long, dehiscing by 3 apical valves; leaf margin generally entire. Large climbers, 10 m long or more; dioecious (*Neoalsomitra* possibly rarely monoecious).
Includes *Alsomitra* (Blume) Roem. (monotypic), *Bayabusua* W.J. de Wilde (monotypic), *Neoalsomitra* Hutch. (several species), *Zanonia* L. (monotypic).

2. ***Subtribe Gomphogyninae*** Pax — Seeds winged or unwinged; fruit small, dehiscing by 3 apical valves; leaf margin serrate. Small climbers, monoecious or dioecious.
Includes *Gomphogyne* Griff. (two species), *Gynostemma* Blume (several species), *Hemsleya* Cogn. ex F. Forbes & Hemsl. (several species).

3. ***Subtribe Actinostemmatinae*** C. Jeffrey — Seeds winged or unwinged; fruit small, dehiscing by an operculum; leaf margin sinuate-dentate. Small, slender climbers; monoecious or dioecious.
Includes *Actinostemma* Griff. (several species), *Bolbostemma* Franquet (two species).

Bayabusua clarkei obviously is a very rare plant, of which up to now only five collections are known. It was originally described by King (1898) in *Zanonia*, based on fruiting material, and later recombined in *Macrozanonia* by Cogniaux (1916). Hutchinson (1942) placed this species in *Alsomitra* mainly for nomenclatoral reasons because the poor type

material, with remnants of a large zononioid fruit and seeds, suggested close relationship with the widespread *Alsomitra macrocarpa* (Blume) Roem. When recently the male flowers became known (male flowers were already collected in 1960, see material studied, but these could not be traced), it immediately was evident that its identity is not with *Alsomitra*, nor with the other genera placed in subtribe Zanoniinae. The male flowers of *Bayabusua* are superficially reminiscent of those of *Hemsleya* (because of the rotund, circular corolla, with the broad lobes revert at the periphery), an otherwise not closely related genus in a different subtribe. Outstanding characters of *Bayabusua* are given in the genus description and listed in Table 1, which compares *Bayabusua* with *Alsomitra*, *Neoalsomitra* and *Zanonia*, the other genera within subtribe Zanoniinae. These characters are briefly discussed below.

Probable monocarpic reproduction and young plant characteristics

In February 1995 a profusely fruiting specimen was seen in somewhat degraded forest at the roadside. Part of it had died, and the remainder, rich in fruit as well, appeared to be in an inviable state. Search for more specimens was not successful. In February 1996 the site was visited again for the same purpose. The fruiting specimen of 16 months ago appeared to have completely vanished, except for, perhaps, a few rotten pieces of the main stem. We assume, therefore, that the (female) plant may be monocarpous, that is, dying after the sole occasion of fruiting, a remarkable feature for such a big liana, but not uncommon in Cucurbitaceae. However, a male specimen was found, flowering in the crown of a very tall tree, and good material could be collected. While searching the forest floor in the surroundings, a number of young plants were seen, and some collected. In July 1998 the place was visited again. Only some green fruit were seen high in the canopy, and some old rotten fruit remnants on the forest floor. Again, a number of (old) seedlings were seen. Young plants appear to be very distinctive: there are two opposite cotyledons, on a long hypocotyl far above the seed-coat remnant, the first leaves are long-petioled, with coarsely dentate-apiculate blade margin, and arranged in a whorl of 3 or 4, the main shoot long and slender, palish, reddish tinged, with widely dispersed leaves, fast-growing and seeking support with circular peltate adhesive pads which are always present at the ends of the two arms of the tendrils. In contrast, in *Alsomitra* the cotyledons remain with germination in the seed, and the young plant grows up by clinging to a substrate with small tendrils with minute pads, normally the trunk of a forest tree, starting with minute spirally arranged leaves, then with distichously arranged leaves appressed to the tree bark, first with minute hastate leaves which gradually become larger, as described by de Wit (1947); Fig. 2. The seedlings and juvenile growth form of *Neoalsomitra* and *Zanonia* are unknown.

Characters at the node: leaves, abscission, tendrils and inflorescences

The leaf (with entire margin) is palmately 5(–7)-nerved, and in the fresh state somewhat fleshy and shining; in *Alsomitra* and *Zanonia* the leaves are somewhat coriaceous, in

Table 1. A comparison of genera of the subtribe Zanoniinae.
Characters marked with an asterisk (*) are possibly of generic significance. [1]) Pollen data from R.W.J.M. van der Ham (1999).

	Bayabusua	***Alsomitra***	***Neoalsomitra***	***Zanonia***
**young plant*	sprawling; 4 verticillate basal leaves	cli nging with adhesive pads; first leaves spirally arranged	not known	not known
size of liana	30 m	50 m	6–12 m	10–15 m
raised petiole scar	present	present	absent	present
**insertion of tendril*	truly axillary	off-axillary	off-axillary	off-axillary
adhesive pads (mature twigs)	circular, peltate	elongated, not peltate	absent	absent (?)
leaf blade	simple	simple	simple or 3–5-foliolate	simple
texture	± carnose	(sub)coriaceous	membranous or carnose	subcoriaceous
blade glands	absent	absent	present or absent	absent
palmate main nerves	5(–7)	3(–5)	3(–5)	3(–5)
**male panicle*	erect raceme-like	pendent	± patent	pendent
bracts	large (5–10 mm)	minute (*c.* 1 mm)	minute, sometimes reduced leaves	minute (*c.* 1 mm)

Table 1 *(continued)*

	Bayabusua	***Alsomitra***	***Neoalsomitra***	***Zanonia***
male flower bud	ovoid	ovoid(-oblong)	ovoid	globose
expanded male perianth shape & diameter	rotate; *c.* 12 mm	campanulate; 8–10 mm	rotate; 5–8 mm	subrotate; 5 mm
**sepals / calyx lobes*	5, ± free, broad triangular, obtuse	bonnet-shaped with apical opening, tearing into 3(–5) lobes	5, free, narrow, acute	globose with minutely 5-lobed apical opening, split into 3(–5) lobes
aestivation corolla lobes	contorted	valvate	imbricate	imbricate
fusion of corolla lobes	nearly free	nearly free	connate in lower half	free
corolla lobes: texture, apex & habit	± carnose, rounded, reflexed	carnose, acute, patent	membranous, subacute, spreading	± carnose, gnawled, suberect, incurved
corolla colour	purple-red	creamy	creamy	creamy
**stamens (filaments)*	3	3	5	5
filaments (fusion)	free	free	free or connate	free
**anthers (thecae)*	2 × 2 + 1 × 1	2 × 2 + 1 × 1 or 3 × 2	5 × 1	5 × 1
thecae opening	lengthwise	lengthwise	± transverse	transverse
swollen connective	present	absent	absent	absent

Table 1 *(continued)*

	Bayabusua	***Alsomitra***	***Neoalsomitra***	***Zanonia***
style remnants in male	absent	absent or 3 very minute	absent	absent
female flower: number of ovules & seed	numerous (female flower not known)	numerous	several to many	2 per locule
fruit shape & size	mitriform-clavate 20–25 cm long	mitriform-globose 20–25 cm diam.	cylindrical-clavate 2.5–8 cm long	cylindrical-clavate, 6–10 cm long
seed shape & size	elliptic, *c.* 20 mm long, 8-(or 9)-toothed	elliptic, 25–30 mm long, margin entire	± ovate, 5–8 mm diam., 3–5-toothed	elliptic, *c.* 15 mm long, margin entire
seed surface	sculptured	smooth	sculptured	smooth
**seed wing(s): number, shape & texture*	1, suborbicular, membranous	(1 or) 2, lateral, membranous	1, length-wise/oblique, membranous	(1 or) 2, length-wise, firm
pollen[1)] *colpi*	very long, partly connected	long, not connected	long, not connected	long, not connected
pollen ornamentation	striate, with lumina	perforate to indistinctly rugulate	striate, without lumina	striate, without lumina
distribution	Peninsular Malaysia	widespread in Malesia	widespread in SE Asia	widespread in SE Asia

Neoalsomitra they may be fleshy or herbaceous. With abscission of the petiole there remains a shallowly concave cushion-shaped scar, a typical feature which it shares with *Alsomitra* and *Zanonia*. The tendril is slightly supra-axillary, not off-axillary, a feature possibly unique in the family; the two arms of the tendrils are always, in the juvenile state as well as in the adult terminal twigs, provided with circular, peltate, adhesive pads (more-or-less cup-shaped when very young and still developing), with which it clings to surrounding (apparently preferably dead) branches for support. Adhesive pads in adult *Alsomitra* are more elongated and non-peltate, whereas adhesive pads have never been seen in *Neoalsomitra*. The male inflorescence in *Bayabusua* develops from the area in the axil between the petiole and the tendril, and is spike-like, somewhat erect, purple-red, as are the bracts (partly), and the corolla of the flowers. The inflorescence can be explained as a much-transformed lateral shoot, in which the bracts (which are usually conspicuously unequal in size) are homologous with vegetative leaves. Near the insertion of the inflorescence the initiation of possibly a next lateral shoot can usually be seen. If at the node no inflorescence develops, the leaf axil produces a vegetative lateral shoot in its place, and then a second vegetative bud may also be found near its insertion.

General characteristics of the male flowers

The (male) flowers are borne in a few-flowered cluster in the axils of the bracts, with the flower buds in very different stages of development, and only a few expanded flowers are present on an inflorescence at a time. The perianth is broadly saucer-shaped, with contorted corolla lobes, much unlike that of *Alsomitra* (with valvate hard-carnose petals) or *Zanonia*. Also the calyx is quite different—in *Bayabusua* the sepals are broad but free, but in *Alsomitra* and *Zanonia* they are initially almost completely fused and the calyx torn into parts with anthesis; in *Neoalsomitra* the sepals are free, slender, the corolla membranous, fused to about half-way. The stamens in *Bayabusua* have their own constellation, with features comparable in uniqueness to those of *Alsomitra*, *Neoalsomitra*, and *Zanonia*. The halfway-fused thecae in the two 2-thecous stamens, and the obovoid swollen connectives (creamy-white, contrasting in colour with the perianth, and brown apical wart) are not found in any other genus. In *Alsomitra* the three stamens are either all 2-thecous (in Java, Sumatra), or two are 2-thecous and one 1-thecous (New Guinea). The condition of three perfect 2-thecous stamens is unexpected or uncommon in the Cucurbitaceae.

Fruit and seed

The fruit conforms with the condition typical of the Zanonioideae, and its size is characteristic for the species; similarly, the seed is very distinct from those of the other genera (Fig. 2).

Palynology

The pollen of *Bayabusua* is distinct among its relatives, as investigated by van der Ham (1999).

In conclusion, the systematic position of *Bayabusua* appears justified as a monotypic, localized endemic genus, within subtribe Zanoniinae. *Zanonia* and *Alsomitra* are obviously only remote relatives, while *Neoalsomitra* is possibly slightly more related but still considerably different.

SOME DEVELOPMENTAL ASPECTS AND POLLINATION OF THE MALE FLOWERS

(Contributed by W.A. van Heel, Rijksherbarium, Leiden)

Material studied: *de Wilde & Duyfjes 21839, 21962* (in FAA alcohol). (Fig. 4)

The hypanthium widens into a funnel-shaped structure from a small bottom and terminates in five calyx lobes and five corolla lobes (petals). This funnel and the petals are covered on the inside with multicellular crimson protuberances. The bottom of the funnel is also crimson. The three stamen filaments are inserted at the bottom on circular bases.

Two of the filaments are broader than the third one, and all three reach up towards the centre and then bend outwards. In total there are five thick and white thecae, each provided with a single set of two longitudinal pollen sacs (sporangia), that open sidewards. If spaced equidistantly within the flower, the thecae are in position alternate with the corolla lobes. The pollen sacs are placed on the thick thecae superficially, facing outwards and opening extrorsely downwards.

In the developed flower, the two thicker filaments are each divided laterally into two thecae. The third filament prolongs into a single median theca, with one set of two pollen sacs, showing no sign of being the one persistent theca of a pair. Frequently the paired thecae adhere below or are united there; sometimes the paired thecae are fully united laterally, looking like a normal anther but for having two apices. The petals are contorted in bud. In fact, the androecium consists of five monothecal stamens which are each bisporangiate medianly. This view is supported by scanning a floral primordium (diameter 400 μm) that showed five nearly semiglobular primordia (25 μm) positioned in a whorl following the petal primordia and alternating with them. At two locations two adjacent stamen primordia become fused laterally at the base. As differentiation into thecae and filaments occurs within the fusing pair of stamens, a single filamentous part is formed in the radius of fusion, that is, opposite the petals. The third—minor—filament develops from the unpaired stamen

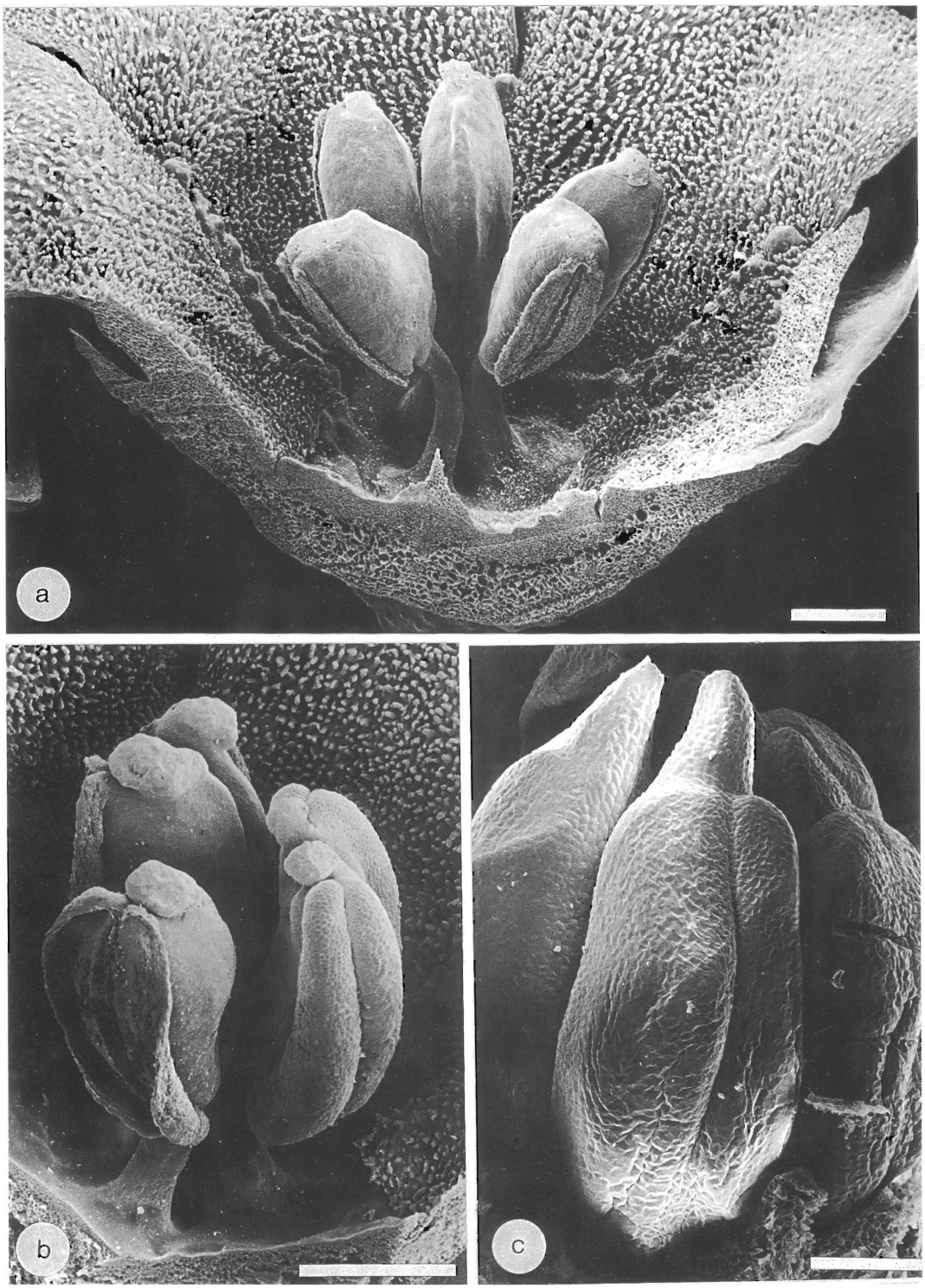

Fig. 4. *Bayabusua clarkei*. **A.** View into mature flower showing stamen thecae: 2 pairs and 1 single (in front left), bar = 1 mm. **B.** View into flower just opened, ibidem. **C.** Detail of floral primordium with monothecous stamen, bar = 0.1 mm.

primordium and remains in alternipetalous position. As is easily observed, this arrangement of three ultimate filaments is maintained in the mature flowers, two antepetalous and one in alternipetalous position.

Judged from their structure, the flowers may attract insects. Flies may use the thick and extended upper sterile parts of the thecae for depositing eggs. In young flower buds the stamens are straight and have a sterile tapering top end. Later, the stamens bend outwards and the thecae form a thick homogenous small-celled structure with knobs or craters terminally. Apart from the inside carpet of crimson protuberances, the hypanthium shows five radial non-protuberant tissue fields which are strikingly white, thus contrasting with the general flower colour. The thecae and their pollen sacs are aligned with and facing these alternating fields of cells. This accommodates insect visitors in between these fields and their contact with the opening pollen sacs.

ACKNOWLEDGEMENTS

The present new genus is named after Baya Busu, the herbarium assistant of FRIM, who accompanied us to Cameron Highlands, and who managed to secure both fruiting and male flowering specimens. We thank the keepers of the following herbaria for providing material for study: K, KEP, SING. The Netherlands Organisation for the Advancement of Tropical Research (WOTRO), The Hague, generously provided financial support for the visit to Malaysia. Our colleague J.-F. Veldkamp was kind enough to translate the diagnosis of the new genus into Latin. Jan van Os, Leiden, prepared the line drawings.

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